

A SURVEY OF BLACKFLIES WITH THREE NEW SPECIES FROM KUANKUOSHUI, GUIZHOU, CHINA (DIPTERA, SIMULIIDAE)

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Abstract This paper provides the first list of the Simuliidae in the Kuankuoshui Nature Reserve, Guizhou China. It's composed of 14 blackflies species, including 3 new species: *Simulium (Simulium) zunyiense* sp. nov., *Simulium (Simulium) neoacontum* sp. nov., and *Simulium (Montisimulium) separatum* sp. nov. The type specimens are deposited in the Department of Biology of Guiyang Medical College.

Key words Diptera, Simuliidae, *Simulium*, new species.

The simuliid fauna of Guizhou has been poorly reported previously, with only 30 species, document by Chen *et al.* (2003), whereas no blackfly species have been reported up to now in Kuankuoshiense Nature Reserve, Zunyi Guizhou China. In Aug. 2010, a number of blackflies were collected from there by authors. A total of 14 species including 3 new species: *Simulium (Simulium) zunyiense* sp. nov., *Simulium (Simulium) neoacontum* sp. nov. and *Simulium (Montisimulium) separatum* sp. nov., which are belong to two subgenera of genus *Simulium* latreille. The descriptions of morphology and illustrations of those new species, and checklist are given.

1 The Checklist

This list adopts a similar taxonomic arrangement to that of Crosskey *et al.* (1996), but differs in providing detailed information on localities and by noting the known life history (♀, ♂, P = pupa, L = larva).

Family Simuliidae Newman, 1834

Subfamily Simuliinae Newman, 1834

Tribe Simuliini Newman, 1834

Genus *Simulium* Latreille s. str., 1802

Subgenus *Gomphostilbia* Enderlein, 1921

S. (G.) mengi Chen, Zhang *et* Wen, 2000

Chen, Zhang and Wen, 2000. 7 (1): 21–28 (♀, ♂, P. L.).

Type locality: Fanjing Mountain, Guizhou, China (Guizhou).

Distribution. China (Guizhou).

Subgenus *Montisimulium* Rubtsov, 1974

S. (M.) separatum sp. nov.

Type locality: Dadong, Guizhou (♀, P. L.).

Distribution. China (Guizhou).

Subgenus *Nevermannia* Enderlein, 1921

S. (N.) mie Osgood *et* Sasa, 1954

Osgood *et* Sasa, 1954; 327–328 (♀, ♂, P. L.). Type locality: Japan. Chen and An, 2003. p. 176. (♀, ♂, P. L.).

Distribution. China (Fujian, Zhejiang, Yunnan, Guizhou); Japan, Korea.

S. (N.) qingshuiense Chen, 2001

Chen, 2000. p. 560–566. (♀, ♂, P. L.).

Type locality: Leigong Mountain, Guizhou.

Distribution. China (Guizhou).

Subgenus *Simulium* Latreille, 1802

S. (S.) bidentatum Shiraki, 1935

Shiraki, 1935; 393–398. (♀, ♂, P. L.).

Type locality: Honshu Is. (Japan).

Distribution. China (Heilongjiang, Liaoning, Shanxi, Qinghai, Fujian, Yunnan, Sichuan, Guizhou); Japan, Korea.

S. (S.) ephippoidium Chen *et* Wen, 1999

Chen and Wen, 1999; 436–439 (♀, ♂, P. L.).

Type locality: Fanjing (Guizhou).

Distribution. China (Guizhou, Sichuan, Yunnan, Guangxi, Zhejiang, Fujian).

S. (S.) neoacontum sp. nov.

Type locality: Kuankuoshui (Guizhou) (♂, P.).

Distribution. China (Guizhou).

S. (S.) gianense Chen *et* Chen, 2001

Chen and Chen, 2001. p. 208 (♀, ♂, P. L.).

Type locality: Leigongshan (Guizhou).

Distribution. China (Guizhou, Sichuan, Yunnan, Hubei, Hunan).

S. (S.) quinquestriatum Shiraki, 1935

Shiraki, 1935; 191–193 (♀, ♂).

Takaoka, 1979; 396–399 (♀, ♂, P. L.).

Type locality: Taiwan (China).

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Distribution. China (Liaoning, Fujian, Jiangxi, Guangdong, Guangxi, Henan, Taiwan); India, Burma, Japan, Korea, Thailand.

S. (S.) rufibasis Brunetti, 1911

Brunetti, 1911: 285–286 (♀).

Takaoka, 1977: 213–216 (♀, ♂, P. L.).

Chen and An, 2003: p. 345 (♀, ♂, P. L.).

Type locality: India.

Distribution. China (Liaoning, Fujian, Taiwan, Hubei, Hunan, Jiangxi, Guangdong, Guangxi, Guizhou, Sichuan, Yunnan); India, Pakistan, Burma, Japan, Korea, Thailand.

S. (S.) sakishimense Takaoka, 1977

Takaoka, 1977: 197–201 (♀, ♂, P. L.).

Chen and An, 2003: 303–305 (♀, ♂, P. L.).

Type locality: Iriomote Is. (Japan).

Distribution. China (Fujian, Zhejiang, Taiwan, Jiangxi, Hainan, Hunan, Hubei, Guizhou, Sichuan, Yunnan); Japan, Thailand.

S. (S.) zunyiense sp. nov.

Type locality: Kuankuoshui, Zunyi (Guizhou) (♀, ♂, P. L.).

Distribution. China (Guizhou).

Subgenus *Wilhelmia* Enderlein, 1921

S. (W.) xingyiense Chen et Zhang, 1998

Chen and Zhang, 1998: 57–59 (♀, ♂, P. L.).

Type locality: Xingyi (Guizhou).

Distribution. China (Guizhou, Sichuan).

2 Descriptions of New Species

Simulium (Simulium) zunyiense sp. nov. (Figs 1–13)

Female. A medium-sized species. Body length about 3.0 mm. Wing length about 2.6 mm.

Head. Slightly narrower than of thorax. Frons black, shiny, grey-pruinose and covered with several black hairs. Frontal ratio 9.0: 6.5: 8.2; and frons-head ratio 9.0: 35.3. Clypeus brownish black, whitish grey-pruinose and covered with dark hairs intermixed with some pale fine hairs. Antenna composed of 2+9 segments, brownish black except scape yellow. Maxillary palp with 5 segments, proportional length of 3rd–5th segments 1.8: 1.6: 5.1, 3rd segment somewhat enlarged with elongated sensory vesicle, which is about 0.36 length of respective segment. Maxilla with 11 outer teeth and 9 inner ones. Mandible with about 28 inner teeth and about 13 outer ones. Cibarium armed with about 30 minute tubercles.

Thorax. Scutum black, semishiny, grey-pruinose anteriorly and laterally, and densely covered with golden yellow pubescence interspersed with several dark hairs on prescutellum area. Scutellum black, with erect long, black hairs as well as dense yellow hairs.

Postscutellum black and bare. Pleural membrane and katepisternum bare. Legs. Fore coxae yellow; mid and hind coxae dark brown. All trochanters yellow except hind trochanters brown. All femora yellow with distal 1/5–1/3 brownish. Fore tibia brown except median large portions of outer surface which are yellow; mid and hind tibiae yellow with distal 1/3 brown. All tarsi brown except basal 2/3 of mid and hind basitarsus and basal 1/2 of hind second tarsomere yellow. Fore basitarsus slender, about 7.2 times as long as wide. Hind basitarsus nearly parallel-sided, about 6.5 times as long as wide. Calcipala enlarged. Pedisulcus developed. Each claw with distinct subbasal tooth. Wing. Costa with spinules as well as hairs. Subcosta fully haired. Base of radius with a tuft of brown hairs. Basal section of radius bare.

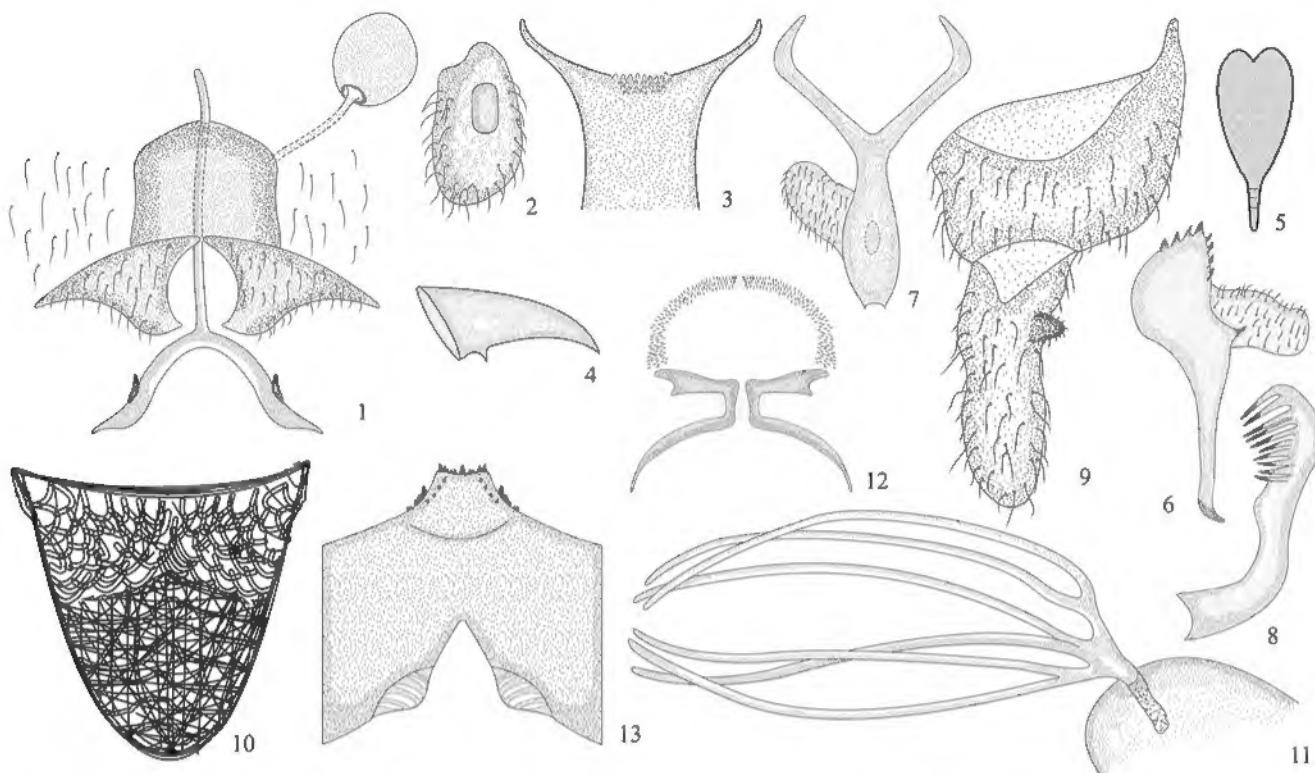
Abdomen. Basal scale yellowish brown with a fringe of brownish yellow hairs. Terga brownish black with dark hairs. Genitalia. Sternite 8 bare medially, with about 30 long stout hairs on each side. Anterior gonapophyses (Ovipositor valve) subtriangular, each with about 30 macrosetae as well as numerous microsetae; inner margin widely concave, and narrowly sclerotized; arms diverged laterally, each with a sclerotized projection directed forwards. Paraproct and cercus of moderate size. Spermatheca somewhat globular in shape and unpatterned.

Male. Body length about 3.3 mm. Wing length about 2.8 mm.

Head. Slightly wider than thorax. Clypeus black grey-pruinose, and with sparse dark hairs. Upper-eye consisting of 22 vertical columns and 26 horizontal rows of large facets. Antenna composed of 2+9 segments, 1st flagellomere about 1.7 times as long as the next one. Maxillary palp with 5 segments, proportional length of 3rd–5th segments 1.7: 1.6: 4.9; sensory vesicle small, about 0.18 of the length of 3rd segment.

Thorax. Scutum black, not shiny, covered densely with golden-yellow fine pubescence and iridescent pattern, a pair of small grey white pruinosis on shoulders, a transverse grayish white band along posterior margin and posterior margin, reaching prescutellar area. Scutellum blackish brown with grey-pruinosity and erect, long hairs as well as dense golden yellow pubescence. Postscutellum black and bare and with grey-pruinosity. Pleural membrane and katepisternum bare. Legs. As in female except for some features, such as all tibiae black with median large portion of outer surface pale yellow, and hind basitarsus somewhat swollen. Wing as in female except for subcosta bare.

Abdomen. Nearly as in female. Genitalia. Coxite quadrate, as long as wide. Style long, subparallel-sided, nearly 2.5 times as long as wide; style with a



Figs 1 - 13. *Simulium (Simulium) zunyiense* sp. nov. 1. Female genitalia. 2. Female sensory. 3. Female cibarium. 4. Female claw. 5. Median sclerite. 6. Ventral plate in side view. 7. Ventral plate. 8. Paramere of male. 9. Coxite and style of male. 10. Cocoon. 11. Filaments. 12. Larval anal sclerite. 13. Larval head capsules.

small subbasal, hairy dorsally produced protuberance. Ventral plate roughly Y-shaped, having a distinct plate-like ventrally produced median process with toothed posterior margins in proximed 1/2, plate body somewhat swollen, spindle-shaped. Basal arms strongly sclerotized and slightly converged apically. Paramere broad basally, tapered toward parameral hooks, with about 13 parameral hooks. Median sclerite plate-like, gradually broadened distally and with a small cleft apically.

Pupa. Body length about 3.5 mm.

Head and thorox. Integument yellowish brown, uniformly covered with dense tubercles. Head trichomes 3 pairs and thoracic trichomes 6 pairs all simple. Gill with 6 filaments of arranged in 3 pairs arising near base; stalk of middle pair almost sessile; dorsal pair filaments slightly thicker than other 4 filaments and diverged in a vertical plate at an angle of less 90 degrees; all filaments practically parallel to one another; all filaments short, about 2/3 times as long as pupal body proper.

Abdomen. Tergum 2 with a long seta and 5 stout setae on each side; terga 3 - 4 each with 4 hooked spines directed anteriorly on each side; terga 7 - 9 each with spine-combs and also comb-like groups of minute spines laterated on each side; tergum 9 with pair of developed terminal hooks. Sternum 4 with a single seta on each side; sternum 5 with pair of bifid hooks

situated close together on each side; sterna 6 and 7 each with pair of bifid hooks widely separated on each side. Cocoon simple, wall-pocket-shaped, moderate woven, with strong anterior margin, specially anteriorly with many small perforations, which are running parallel to antero-lateral border and lying just behind it.

Marture larva. Body length 6.0 - 7.0 mm. Body color grayish yellow. Cephalic apotome with faint positive head spods. Antenna with 3 segments and a terminal sensory organ; proportional lengths of 3 segments from base to tip of 15: 14: 10. Labral fan each with 36 - 38 main rays. Mandibles with a large and a small mandibular serrations but lacking supernumerary serrations. Hypostomium with a row of 9 apical teeth, corner and median teeth prominent and intermediate teeth small, lateral serration developed an apical 1/2; 3 or 4 hypostomial setae lying parallel to lateral margin on each side. Postgenal cleft triangular, pointed anteriorly, length about 1.5 times than that of postgenal bridge. Thoracic and abdominal integument bare. Rectal gill lobes each with 11 - 13 finge-like secondary lobules. Anal sclerite X-formed with posterior arms much longer than anterior one; ring of minute spines round rectal pupilla. Posterior circlet with about 80 rows of 12 - 15 hooks per row.

Holotype ♂, reared from pupa, slide-mounted,

was collected from a small trickle of water from Dadong ($28^{\circ} 12' N$, $107^{\circ} 18' E$; alt. 1 483 m), Kuankuoshui, Zunyi City, Guizhou, China, Aug. 2010. Taken from submerged grass blades exposed to sun by XIU Jiang-Fan and CHEN Qian.

Distribution. Guizhou, China.

Remarks. This new species seems to fall into the *variegatum* group of subgenus *Simulium* by Rubtsov (1959 – 1964) by having the characteristic shape of the anterior gonapophyses and the claws with subbasal tooth in the female. There are a few Oriental species which closely resemble this new species, i.e., *S. himalayense* Puri, *S. nigricum* Puri, *S. guineyae* Senior-White from India, *S. hackeri* Edwads from Malaysia, *S. aokii* Takaoka from Japan, *S. chalong* Takaoka, *S. barnesi* Takaoka from Thailand, and *S. qianense* Chen and Chen and *S. taiwanicum* Takaoka from China. The new species, however, can be separated from all the related species mentioned above by the features of the male genitalia, such as the shape of the

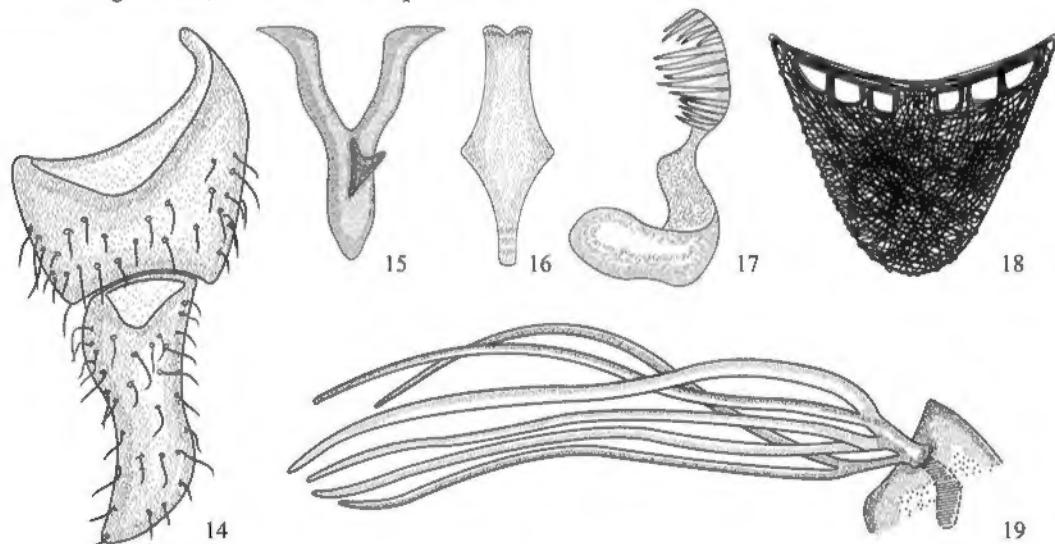
style, ventral plate and median sclerite.

Etymology. The specific name refers to the type locality.

***Simulium (Simulium) neoacutum* sp. nov. (Figs 14 – 19)**

Male. Body length about 3.0 mm, Wing length about 2.9 mm.

Head. As wide as thorax. Upper eye consisting of large facets in vertical columns and 12 horizontal rows. Clypeus black brown, whitish grey pruinose covered with dark brown, long hairs. Antenna composed of 2 + 9 segments, brown except scape brownish yellow; 1st flagellomere elongate, about 2.2 times as long as 2nd one. Maxillary palp composed of 5 segments; proportional lengths 3rd – 5th segments 5.2 : 5.0 : 9.5; 3rd segment of normal size, with elliptical sensory vesicle about 0.27 times as long as 3rd segment.



Figs 14 – 19. *Simulium (Simulium) neoacutum* sp. nov. 14. Coxite and style of male. 15. Ventral plate. 16. Median sclerite. 17. Paramere of male. 18. Cocoon. 19. Filaments.

Thorax. Scutum dark brown, grey pruinose and covered with golden yellow recumbent pubescence. Scutellum brownish black, grey-dusted and with erect black hairs. Postscutellum black brown, grey-dusted and bare. Pleural membrane and katepisternum bare. Legs. All coxae and trochanters brown except fore coxa, basal 1/2 of trochanter and mid-trochanter pale. All femora yellow with apical 1/3 brown. All tibiae brown except median large portion yellow. All tarsi brown except hind basitarsus and basal 1/2 of second tarsomere pale yellow. Fore basitarsus somewhat dilated, W:L ratio 1.0:6.5. Hind basitarsus dilated, about 3.8 times as long as its greatest width. Wing. Costa with spinules and hairs; subcosta haired except apical 1/2 bare; based section of vein R bare; base of

radius with a tuft of brown hairs.

Abdomen. Basal scale medium brown with fringe of yellowish brown hairs. Terga dark brown, moderately covered with black hairs. Genitalia. Coxite in ventral view nearly quadrate; style in ventral view elongate, about 2.3 times as long as its greatest width at basal 1/3, beyond basal 1/3 become slightly narrow and curved inwards distally. Ventral plate in ventral view long plate-shaped, nearly parallel-sided, tapered distally and with a ventrally produced median process; basal arms strongly sclerotized and as long as plate body. Parameres large basally and each with about 17 parameral hooks. Median sclerite plate-shaped, its greatest width at basal 1/3, gradually narrow distally and with a small cleft apically.

Pupa. Body length about 2.8 mm.

Head and thorax. Integument yellow, lacking any tubercles. Head with 1 longer facial and 2 shorter frontal trichomes; thorax with 5 pairs of simple trichomes. Gill with 6 slender thread-like filaments arranged in (2+2)+2 from dorsal to ventral; common basal stalk very short, dorsal and middle pairs with medium-long stalk, whereas ventral pair with long stalk which is slightly thinner than stalk of middle pair and dorsal pair; stalks of dorsal and ventral pairs diverged basally at angle of about 60 degrees; all filaments with annular ridges and covered with minute tubercles.

Abdomen. Tergum 2 with a long simple seta and 5 short spinous setae on each side; terga 3-4 each with 4 hook-like spines directed forward along posterior margin on each side; tergum 8 with spine-comb in transverse row; tergum 9 lacking terminal hooks. Sternite 5 with pair of bifid hooks situated closely together on each side; sternites 6-7 each with pair of bifid hooks widely spaced on each side. Cocoon. Wall-pocket-shaped, tightly woven, with moderately strong anterior margin, specially anteriorly with 3 antero-lateral windows on each side, those windows running parallel to anterior border and lying just behind it.

Type materials. Syntype ♂, reared from pupa, slide-mounted with pupal exuvia, was collected in a shaded stream from Rangshui, Kuankuoshui, Guizhou (28°17'N, 107°08'E; alt. 682 m), Aug. 2010, was taken from trailing grasses exposed to the sun by XIU Jiang-Fan.

Female and larva. Unknown.

Distribution. Guizhou, China.

Remarks. This new species seems to fall into the *malyschevi* group of *Simulium* (*Simulium*) by the Y-formed ventral plate in the male, the 6-filamented gill and the cocoon simple wall-pocket-shaped with anterolateral windows in the pupa.

The new species is closely allied to the *S. (S.) aconitum* Chen, Zhang et Huang, 2005 from Sichuan China, but can be readily separated from the latter by the shape of ventral plate and median sclerite in the male, and the characteristic branching method of the pupal gill filaments.

Etymology. The species name refers to the name by the morphology of male and pupa, which are very similar *S. (S.) aconitum*, Kuan kuoshui, where this new species was collected.

Simulium (Montisimulum) separatum sp. nov.
(Figs 20-27)

Female. Body length 3.3 mm. Wing length about 2.6 mm.

Head. Slightly narrower than thorax. Frons black

with grayish-white hairs. Clypeus black, grey-dusted. Frantal ratio 6.5:5.5:6.2. Frons-head ratio 6.5:29.4. Antenna composed of 2+9 segments brown except scape brownish yellow; 1st flagellomere about 1.7 times as long as 2nd one. Maxillary palp consisting of 5 segments, proportional lengths of 3rd-5th segments 6.5:4.1:10.5; 3rd segment somewhat enlarged, sensory vesicle elongate, about 0.6 times as long as respective segment. Maxillary lacinia with 5 inner and 10 outer teeth. Mandible with 24 inner teeth and lacking outer teeth. Cibarium smooth on posterodorsal margin.

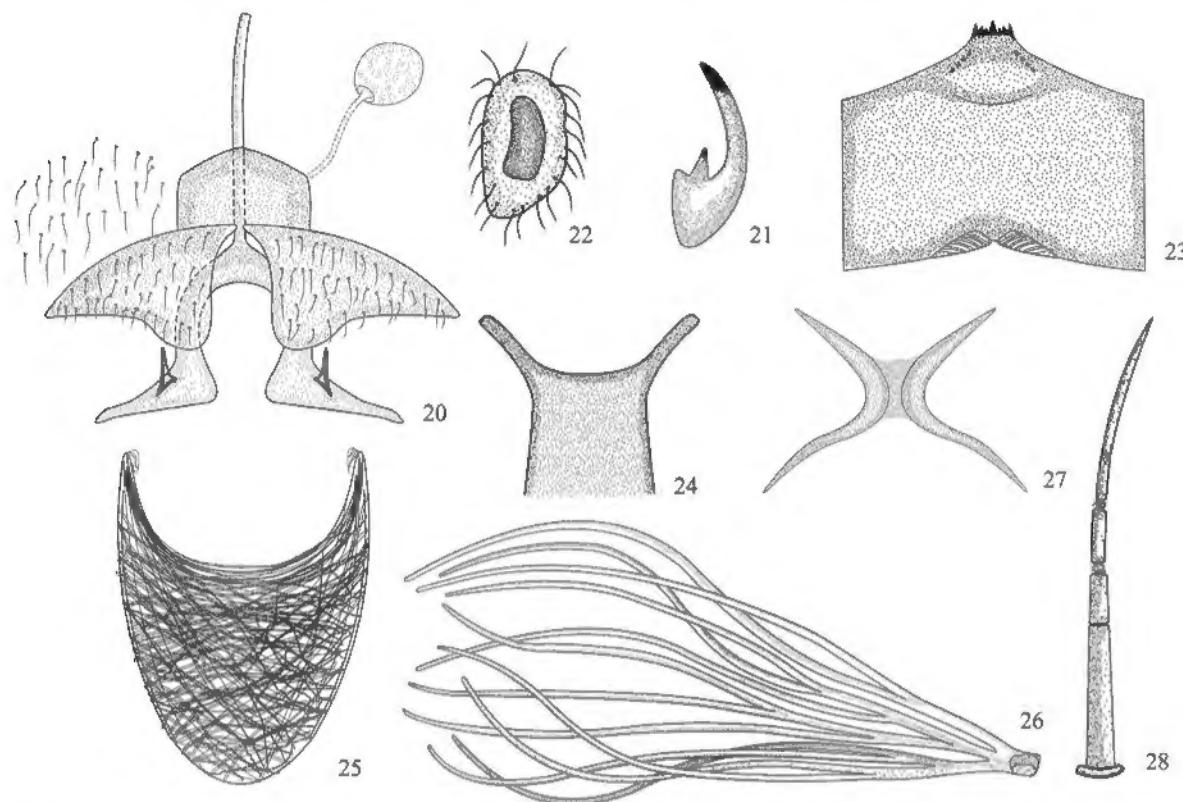
Thorax. Scutum blackish brown and densely covered with whitish-yellow recumbent hairs mixed with several black long hairs on prescutellar area. Scutellum medium brown, with dark long hairs as well as yellowish white shorter hairs. Postscutellum dark brown and bare. Pleural membrane and katepisternum bare. Legs. All coxae brown. All trochanters brown except basal 1/2 of fore and mid trochanters yellow. All femora yellow except each distal 1/4 which is brown. All tibiae brown with median large portions yellow. All tarsi brown except hind basitarsus and basal 1/2 of second tarsomere pale. Fore basitarsus slender cylindrical, about 8.5 times as long as wide. Hind basitarsus nearly parallel-side about 6.5 times as long as wide. Calcipala and pedisulcus moderately developed. All claws each with medium-sized basal tooth about 0.33 times of claw. Wing. Costa with 2 parallel rows of black short spines as well as dark hairs. Subcosta hairy. Basal portion of radius fully haired. Hair tuft on stem vein dark brown.

Abdomen. Basal scale light brown, with fringe of yellowish broom hairs. Terga dark except 2nd segment pale, moderately covered with whitish-yellow short hairs interspersed with black ones. Genitalia. Sternite 8 wide, bare medially but furnished with a lot of long hair on each side. Anterior gonapophyses nearly triangular; densely coved with microsetae; inner margins narrowly sclerotized nearly parallel-side and widely separated from each other. Genital fork inverted-Y shaped, with well sclerotized stem and wide arms; each arm produced posteromedially in front of wide triangular plate, and with distinct sclerotized projection directed forwards. Paraproct in lateral view moderately protruding ventrally. Cercus rounded posteriorly; spermatheca nearly ovoidal with weak pattern.

Male. Unknown.

Pupa. Body length about 4.0 mm.

Head and thorax. Integument yellowish brown, densely covered with tubercles. Trichomes all simple and very minute. Gill 12-filamented, approximately



Figs 20 – 28. *Simulium (Montisiumulum) separatum* sp. nov. 20. Female genitalia. 21. Female claw. 22. Female 3rd segment of maxillary palp. 23. Larval head capsules. 24. Female cibarium. 25. Cocoon. 26. Filaments. 27. Larval sclerite. 28. Larval antenna.

2/3 length of pupal body, arranged in group of 2 + (2+1) + (2+1) + 2 + 2 from dorsal to ventral; arising from a very short basal stalk and with a short stalk of dorsal pair filament; each filament with transverse ridges and numerous brownish black small tubercles in outer cuticular layer of surface.

Abdomen. Terga 1 – 2 tubercular; tergum 2 with a longer seta and 5 short slender setae; terga 3 – 4 each with 4 hooked spines on each side; terga 5 – 8 each with spine-combs on each side; tergum 9 with pair of well-developed terminal hooks. Sternum 5 with pair of bifid hooks situated closely together on each side; Sterna 6 – 7 each with pair of bifid hooks widely spaced on each side. **Cocoon.** Wall-pocket-shaped, tightly woven, slightly extending ventrolaterally but lacking definite anterior margin and anterodorsal projection.

Mature larva. Body length about 6.5 – 7.5 mm. Cephalic apotome yellowish brown with faint positive head spots. Antenna with 3 segments and a terminal sensory organ; proportional length of 3 segments from base to tip of 7.0:9.1:6.8, much longer than stem of labral fan. Labral fan with about 40 main rays. Mandible with comb teeth unequal in length, first tooth longer than other, 2nd and 3rd almost same in length. Mandibular serrations composed of a large and a small tooth but lacking supernumerary serrations.

Hypostomial teeth 9 in number, corner and median teeth strongly prominent and intermediate ones smallest; 4 – 5 hypostomial setae one each side lying subparallel to lateral margins; lateral serrations weakly developed. Postgenal cleft very minute. Thoracic and abdominal integument bare. Rectal gill compound, each with 14 – 16 finger-like secondary lobules. Anal sclerite X-shaped with anterior arms about 0.8 times as long as posterior ones. Posterior circlet with about 94 rows of up to 15 hooklets per row. Ventral papillae well developed.

Type materials. Syntype ♀, reared from pupa, slide-mounted with pupal exuvia, was collected from stone in a fast-flowing small stream from Dadong, Kuankuoshui, Guizhou Province ($28^{\circ} 12' N$, $107^{\circ} 18' E$; alt. 1483 m), 5 pupae, 9 larvae, same day as female by XIU Jiang-Fan and CHEN Qian.

Distribution. Guizhou, China.

Remarks. This new species seems to fall into the *Simulium (Montisiumulum)* by the shape of the female genitalia, by the having 12 filaments in the pupa and with a small postgenal cleft in the larva. The present new species seems to be most closely related to *S. (M.) nemoriragum* (Datta, 1973), but can be readily separated from latter by several characters, such as the inner margin of anterior gonapophyses is widely separated from each other, the stalk of dorsal pair

filament very short and in number of main ray of labral fan and rectal gill lobes in the larva.

Eymology. The specific name was given by the inner margins of anterior gonapophyses widely separated in the female.

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中国贵州宽阔水自然保护区蚋相初报及三新种描述（双翅目，蚋科）

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摘要 首次记载贵州省宽阔水自然保护区蚋科 Simuliidae 14 种，并记述其中 3 新种，包括遵义蚋 *Simulium (Simulium) zunyiense* sp. nov. 和新尖板蚋 *Simulium (Simulium) neoacontum* sp. nov. 以及隶属于山蚋亚属 *Simulium (Montisimulium)* 的离板山蚋 *Simulium (Montisimulium) separatum* sp. nov.。模式标本存放于贵阳医学院生物学教研室。

遵义蚋，新种 *S. (S.) zunyiense* sp. nov. (图 1~13)

隶属于蚋亚属杂色蚋组 *variegatum* group，与本组已知近缘种主要区别在雄尾结构，如生殖肢端节，生殖腹板和中骨的形状特殊。

正模 ♂，贵州遵义市宽阔水自然保护区 (28°12'N, 107°18'E; 海拔 1 483 m)，2010-09-20，修江帆，陈黔采。

词源：新种种名源自模式产地。

新尖板蚋，新种 *S. (S.) neoacontum* sp. nov. (图 14~19)

隶属于蚋亚属淡足蚋组 *malyschevi* group，与尖板蚋 *S. (S.) acanthum* Clen et al.，近似，但雄虫生殖肢端节，生殖腹板

关键词 双翅目，蚋科，蚋属，新种。

中图分类号 Q969.442.9

和中骨的形状迥异，此外，其呼吸丝排列方式也有明显差异。

正模 ♂，贵州宽阔水自然保护区让水 (28°17'N, 107°08'E; 海拔 682 m)，2010-08-13，修江帆采。

词源：新种种名源自其形态极似尖板蚋 *S. (S.) acanthum*，冠以“neo”以示区别。

离板山蚋，新种 *S. (Montisimulium) separatum* sp. nov. (图 20~28)

隶属于山蚋亚属 Subgenus *Montisimulium* 与绒丝山蚋 *S. (M.) nemoriragum* (Datta, 1973) 近似，主要区别是雌虫生殖板内缘远离，蛹呼吸丝背对具短茎。此外，幼虫头扇毛和肛鳃次生叶数目也有明显差异。

正模 ♀，贵州宽阔水自然保护区大洞 (28°12'N, 107°18'E; 海拔 1 483 m)，2010-08-20，修江帆，陈黔采。

词源：新种种名源自其雌虫生殖板内缘分离。

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